

Achievement of Competencies of the Students of BRAC Non-Formal Primary Schools, 2000-2002

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Abstract

Using the test instrument developed for *Education Watch 2000*, this study assessed the achievement of competencies of the students of BRAC non-formal primary schools. Three batches of students (second, third and fourth) completing full cycle of primary education within a time span of four years were the subjects of this study. The findings reveal that with regard to competency achievement the students of all the three batches performed equally. Both inter and intra school variations in performance reduced over time. However, gender gap, where girls were behind the boys, increased sharply. In order to increase overall performance and to reduce gender gap classroom teachings in Mathematics, Social Studies and General Science need to be examined carefully.

Introduction

In 1988, the National Curriculum and Textbook Board (NCTB) of the Ministry of Education, government of Bangladesh has specified 53 terminal competencies to be achieved by the students completing five year cycle of primary education. Competency-based education was introduced in 1992. This means that these competencies are incorporated in the syllabus and the textbooks were revised accordingly. These competencies are accompanied by a set of learning continuum specified separately for each grade. It is expected that the students would achieve these competencies throughout the primary education cycle of five years (from grade I to grade V). Recently the NCTB has modified the list of competencies and now there are 50 competencies in the list. Such a modification had no affect in the cognitive type of competencies.

Although called Non-formal Primary Education (NFPE), BRAC offers full course of primary education following the formal school curriculum of the NCTB. In BRAC schools, students get the full course of primary curriculum within a time span of four years. During first three academic years the students read the textbooks prepared by BRAC, and for rest of the period (for grades IV and V) the NCTB prepared textbooks are used.

The second *Education Watch* study investigated the competencies achievement of the students in 2000, where non-formal primary school students were also considered. In the non-formal stratum a good number of BRAC schools were taken. These students were the second batch completing full cycle of primary education from BRAC non-formal primary schools. Although there was no scope of separate analysis of the achievement of these students under *Watch* project, the BRAC Education Programme (BEP) felt a need to do so for their understanding. BEP also requested the Research and Evaluation Division (RED) to do similar assessment regularly. The second such assessment was done among the course completers of 2001, and the third one among those of 2002 cohorts. Results of the second assessment along with a comparison with the first assessment were reported earlier (Nath 2002). This report presents results from three successive assessments.

Objective

This study aimed to assess competency-based learning outcome of the students of BRAC non-formal primary education (NFPE) programme completing full cycle of primary education in 2000, 2001 and 2002.

Methodology

The instrument

The test instrument developed for the *Education Watch 2000* was used for this study. The instrument incorporated 27 of the 29 cognitive competencies in the NCTB list. There are 64 test items in the instrument. The subjects are Bangla, English, Mathematics, Social Studies, General Science and Religious Studies. Following table presents the number of competencies and the test items by subject. Annex 1 provides a list of competencies addressed in this study.

Table 1. Number of competencies and question items by subject

Subject	Number of competencies addressed	Number of question items in the test
Bangla	3	10
English	3	7
Mathematics	5	15
Social Studies	6	13
General Science	9	18
Religious Studies	1	1
All	27	64

Sampling

This study considers only the rural schools under the BRAC NFPE programme. The data of the first assessment came from *Education Watch 2000*. There were 26 BRAC schools in the sample. The number of students assessed was 357, 175 girls and 182 boys (Nath *et al* 2001).

Similar sampling strategy was applied for the second and the third assessment. In each, 30 team offices from rural Bangladesh were randomly selected where schools were at the end of completing the fifth grade. One school from each team was randomly selected. Separate samples were drawn from the girls and the boys through a systematic sampling procedure. From each school 7 girls and 7 boys were selected. Total sample with a breakdown by year and sex is presented in Table 2.

Table 2. Sample at a glance

Sex	Survey 2000	Survey 2001	Survey 2002	Total
Girls	175	211	211	597
Boys	182	209	209	600
Total	357	420	420	1,197

Administering the test

The test was administered in a similar way in all the three surveys. In each school all 14 students were tested at a time in their own classrooms. A team of two trained test administrators conducted the test.

The whole test was divided into three parts. Tests for Bangla and English languages were offered in the first one-hour. Tests for Mathematics, Environmental Studies and Religious Studies were given during the second hour. Listening test for Bangla and English took ten minutes. There were ten minutes break between each part. At the beginning the test administrators took the opportunity to make the students understand the rules and regulations of the test. Flip charts and blackboards were used to do so. The surveys were carried out in October and November of the years 2000, 2001 and 2002, i.e., just before the ending of the respective cycles.

Limitations

The students assessed for this study were drawn from the rural schools, because majority of the BRAC schools are in the rural areas. Thus, this study presents the situation of the BRAC NFPE schools in rural areas only. Again, only the cognitive competencies were assessed. However, objective of any education is to develop both cognitive and non-cognitive aspects of the students' ability.

Findings

Achievement of Bangla competencies

There are four competencies in Bangla, of which three were considered for assessment. These are *Reading*, *Writing* and *Listening*. No test was taken for assessing vocabulary of the students. Ten question items were placed in the test for Bangla. Table 3 provides a summary of the competencies, test items, and minimum level for qualifying each of the competencies.

Table 3. Competencies, test items, and minimum levels for Bangla

Competency	Test items	Minimum level
Reading	<ul style="list-style-type: none">• Answer two questions from a printed paragraph• Answer two questions from a hand written paragraph	Answer one correctly Answer one correctly
Writing	<ul style="list-style-type: none">• Describe a given scenery in four sentences• Describe own home in four sentences• Fill out a form with eight blanks (any six is acceptable)• Write an application with date, salutation, and closing (message with any two acceptable)	Answer correctly any three on the left
Listening	Answer two questions based on a pre-recorded paragraph	Answer one correctly

Reading skills

The students' ability to read printed and hand written materials were assessed. Nearly 71 percent of the students satisfied the minimum requirement for this competency in the year 2000. This was 67.1 percent in 2001 and 74.1 percent in 2002 (Table 4). Although there was no statistically significant variation in the performances of the students of the cohorts of 2000 and 2001, however, the students of 2002 showed significantly better performance than those of cohort 2001. The boys did significantly better than the girls in all the three surveys. Although performances of both boys and the girls increased over time, it was more among the boys. This ultimately resulted an increased gender gap in reading in 2002 compared to two previous surveys (Annex 2).

Table 4. Percentage of students achieving Bangla competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	2000 vs. 2001	2000 vs. 2002	2001 vs. 2002
Reading	70.9	67.1	74.1	ns	ns	p<0.05
Writing	72.5	70.7	62.6	ns	p<0.01	p<0.01
Listening	82.6	90.4	85.1	p<0.001	ns	p<0.05
All three	47.5	52.0	47.8	ns	ns	Ns

ns = Not significant at p=0.05

Writing skills

There were four questions for assessing writing skills in Bangla. These are description of a seen and an unseen objects, fill up a form and write an application. Among the students of 2000, 72.5 percent achieved this competency. This was 70.7 percent for the cohort of 2001 and 62.6 percent for the cohort of 2002 (Table 4). Although there was no difference in the performances of the students of the first two cohorts, but the performance of students of 2002 significantly deteriorated from that of the previous two cohorts (p<0.01 for both). The boys and the girls performed equally in all the surveys (Annex 2).

Of the four questions under writing skills students did very well in filling up a given form, over 95 percent of the students of each of the cohorts could correctly answer this question (Annex 3). Although over three quarters of the students of the first two cohorts wrote at least three sentences describing a seen object, it deteriorated to 58.2 percent among the students of 2002. However, in case of describing a seen object 71.8 percent wrote three sentences in 2000, which reduced to 61.3 percent in 2001 and again increased to 75 percent in 2002. Writing an application to teacher was the hardest part in writing assessment. Proportion of students satisfying the requirements of writing an application was 53.2 percent in 2000, 59.2 percent in 2001 and 40.9 percent in 2002. It can be seen that students of 2002 showed poor performance in writing an application to their teachers. The students of all the three cohorts generally did not write the date on the application. Less than a third of the students of 2002 wrote the date on the application.

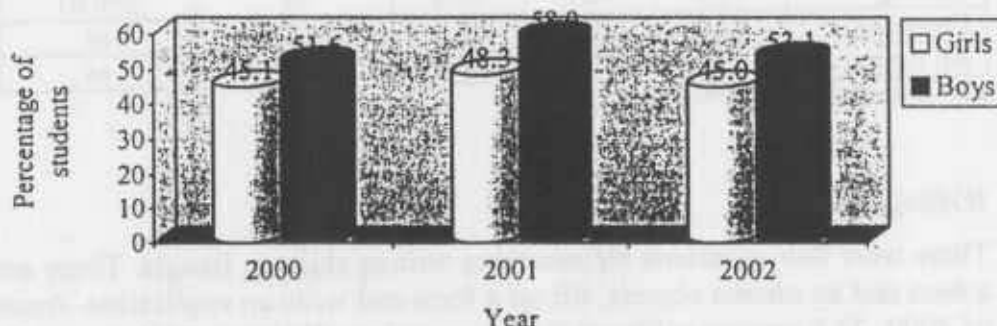
Listening skills

In all the three surveys, students did better in listening test compared to other two areas (reading and writing). Table 4 shows that performance of the students in listening significantly increased from 82.6 percent in 2000 to 90.4 percent in 2001 ($p < 0.001$) again significantly decreased to 85.1 percent in 2002 ($p < 0.05$). No gender difference was observed in listening skills in any of the surveys (Annex 2).

Overall performance in Bangla

Over 47 percent of the students achieved all the three Bangla competencies in 2000; it was 52 percent in 2001 and 47.8 percent in 2002 (Table 4). Statistically, the students of different years performed equally in this regard. Figure 1 shows percentage of students achieving all the three competencies in Bangla by year and sex. Significant gender difference was observed only in 2001.

Figure 1. Percentage of students achieving all three competencies in Bangla by year and sex



Some of the students did not achieve any of the competencies in Bangla, 3.7 percent in 2000, 3.3 percent in 2001 and 5 percent in 2002. Such performance was seen prominent among girls than boys. For instance, 1.9 percent of the boys and 6.6 percent of the girls failed to achieve any of the competencies in 2002. On average, the students achieved 2.3 competencies in 2000 and 2001, and 2.2 competencies in 2002.

Achievement of English competencies

Like Bangla, three out of four competencies were assessed in English. These are *Reading*, *Writing* and *Listening* skills. Vocabulary was not considered for test. There were seven question items in the test. Table 5 presents a summary of the competencies, corresponding test items, and minimum level of for qualifying the competencies in English.

Table 5. Competencies, test items and minimum levels for English

Competency	Test items	Minimum level
Reading	<ul style="list-style-type: none"> • Answer two questions from a printed paragraph • Answer two questions from a handwritten paragraph 	Answer one correctly Answer one correctly
Writing	Describe a given picture in five sentences	Write three sentences
Listening	Answer two questions based on a pre-recorded dialogue between two friends	Answer one correctly

Reading skills

Like Bangla, students ability in reading hand written and printed materials was assessed in English. Nearly three quarters of the students achieved this competency in 2000, which significantly decreased to 67.8 percent in 2001 ($p < 0.05$), and again significantly increased to 76.3 percent in 2002 ($p < 0.01$) (Table 6). No gender difference was observed in any of the surveys (Annex 4).

Writing skills

Students' were asked to write five sentences on a seen object, correctly writing three sentences was considered as minimum qualification for achieving this competency. Performance of the students in this competency was not satisfactory; 39.2 percent of the students in 2000, 36.8 percent in 2001, and 35.1 percent in 2002 achieved this competency (Table 6). No significant difference was observed in the performance of the students of different years. There was no gender difference in any of the surveys (Annex 4).

Table 6. Percentage of students achieving English competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	2000 vs. 2001	2000 vs. 2002	2001 vs. 2002
Reading	74.5	67.8	76.3	$p < 0.05$	ns	$p < 0.01$
Writing	39.2	36.8	35.1	ns	ns	Ns
Listening	68.0	78.1	79.9	$p < 0.01$	$p < 0.001$	Ns
All three	26.0	30.3	28.2	ns	ns	Ns

ns = Not significant at $p = 0.05$

It was common in all the three surveys that a majority of the students were unable to conceptualise what they wanted to write seeing the given object. A good proportion of the students' just picked a portion of the object (e.g., table, book, chair, etc.) and tried to make sentence with it. This competency was so hard for the students that 37.7 percent of the students in 2000, 31.5 percent in 2001 and 30.5 percent in 2002 did not answer this question. One interesting observation is that proportionately more students tried to answer this question day by day.

Listening skills

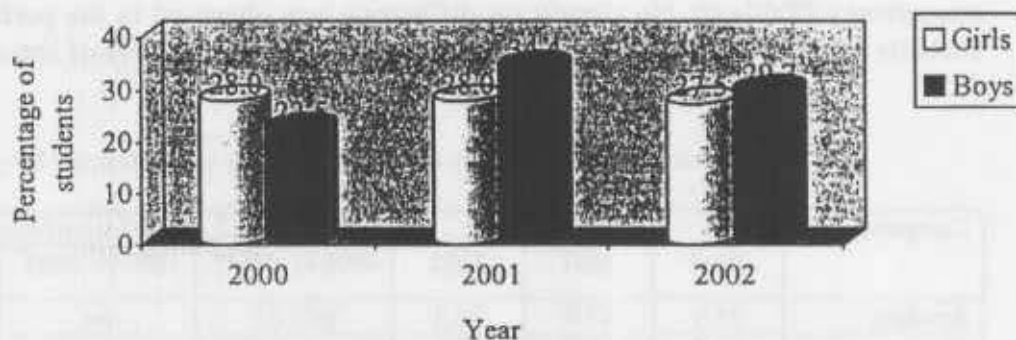
Performance in listening in English was better than other two competencies. Students' skills also increased in this competency over the period. Sixty eight percent of the students achieved this competency in 2000, which significantly increased to 78.1 percent in 2001 ($p < 0.001$), and again increased to 79.9 percent in 2002 (Table 6). There was no gender difference in listening competency in 2000 and 2002; however, in 2001 the boys significantly outperformed the girls in 2001 (Annex 4).

Overall performance in English

Proportion of students achieving all the three competencies in English was 26 percent for 2000, 30.3 percent for 2001 and 28.2 percent for 2002 (Table 6). No significant variation was observed in this regard. Statistically, there was no gender variation in this regard in any of the surveys.

Some of the students failed to achieve any of the English competencies each year. Interestingly, proportion of the students achieving no English competency decreased over the period. Over 10 percent of the students in 2000, 7.6 percent in 2001 and 6.2 percent in 2002 did not achieve any competency in English. In each survey, this proportion was higher for girls than the boys. For instance, in 2002, 3.3 percent of the boys and 7.6 percent of the girls did not achieve any English competency.

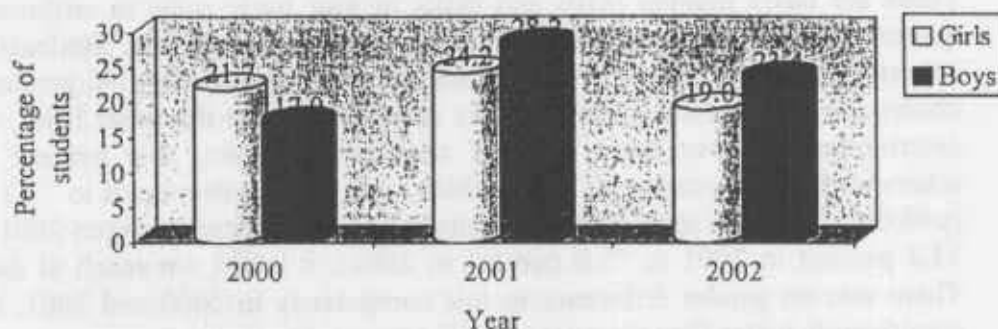
Figure 2 Percentage of students achieving all three competencies in English by year and sex



Overall performance in language

A fifth of the students achieved all the six competencies in Bangla and English languages in 2000, this increased to 25.8 percent in 2001 and again decreased to 20.4 percent in 2002. Similar analysis, separately for boys and girls, is presented in Figure 3. The girls were ahead of the boys in achieving all the six competencies in language in 2000, the situation reversed in 2001 and onwards. Each year, some students (about one percent) did not achieve a single language competency.

Figure 3 Percentage of students achieving all six competencies in Bangla and English languages by year and sex



Achievement of Mathematics competencies

Competencies in Mathematics covers both arithmetic and geometry. There are five competencies in Mathematics, for which 15 question items were placed in the test instrument. The competencies cover the areas of basic number skills, four rules of arithmetic, problem solving, measurement of units, and geometric figures. Table 7 presents the competencies, test items, and minimum requirement level for qualifying the Mathematics competencies.

Table 7. Competencies, test items and minimum levels for Mathematics

Competency	Test items	Minimum level
Basic numbers	<ul style="list-style-type: none"> • Arrange four given numbers in ascending order • Identify the largest from four given digits 	Answer correctly any one of the items on the left.
Four basic rules	<ul style="list-style-type: none"> • An addition • A subtraction • A multiplication • A division • A simplification 	Do the simplification correctly or any three of the four others
Problem solving	Four sums needing skills on <ul style="list-style-type: none"> • Basic arithmetic operation • Unitary method • Percentage • Graph 	Answer correctly any two of the items on the left
Measurement units	<ul style="list-style-type: none"> • Convert 5 hours and 25 minutes to seconds • Find the length of a pencil 	Answer correctly any one of the items on the left
Geometric figures	<ul style="list-style-type: none"> • Find the number of triangles and rectangles in a figure • Identify four geometric figures 	Answer correctly any one of the items on the left

Table 8 provides percentage of students achieving various Mathematics competencies in the surveys. Students' did comparatively better in two competencies in all the surveys. These are basic number skills and skills in four basic rules in arithmetic. About three quarters of the students achieved these competencies each year. Students' of all the three cohorts performed equally in the 'basic number' competency. No gender difference was observed in any of the surveys in this competency. On the other hand, the performance deteriorated in 'four basic rules of arithmetic'. Eighty two percent of the students achieved this competency in 2000, which significantly decreased to 73.2 percent in 2001 ($p<0.01$). Although some improvements have been noticed between 2001 and 2002 (from 73.2 percent in 2001 to 75.8 percent in 2002), it could not reach at the level of 2000. There was no gender difference in this competency in 2000 and 2001, but the boys did significantly better than the girls in 2002 (Annex 5).

Table 8. Percentage of students achieving Mathematics competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	2000 vs. 2001	2000 vs. 2002	2001 vs. 2002
Basic number	78.8	76.9	78.9	Ns	ns	ns
Four basic rules	82.0	73.2	75.8	$P<0.01$	$P<0.05$	ns
Problem solving	39.4	30.2	36.2	$P<0.05$	ns	ns
Measurement unit	46.9	46.7	44.0	Ns	ns	ns
Geometric figures	52.8	51.5	59.7	Ns	ns	$p<0.01$
All five	23.6	21.7	16.1	Ns	$P<0.01$	$p<0.05$

ns = Not significant at $p=0.05$

Of the four arithmetic rules, students performed well in addition followed by subtraction, multiplication and division (Annex 6). Over 85 percent of the students correctly did the given addition in all the surveys, for subtraction it was 74-80 percent, and for multiplication 65-70 percent. In case of division, 45.6 percent could correctly answer this question in 2000, which significantly decreased to 31.6 percent in 2001 and again improved to 38.3 percent in 2002. Sixty percent of the students in 2000, 56 percent in 2001 and 57.2 percent in 2002 could correctly answer the given simplification.

Problem solving was the hardest competency in Mathematics. Nearly 40 percent of the students' of 2000 was competent in this, which decreased to 30.2 percent in 2001, and again increased to 36.2 percent in 2002 (Table 8). Although there was no gender difference in this respect during the first two surveys, the boys outperformed the girls in 2002. To assess this competency there were four sums needing skills on basic arithmetic operation, unitary method, percentage, and graph. The students of the year 2001 performed poor in all the four sums compared to the students of the year 2000 (Annex 7). There was no difference in the performance of the students of 2001 and 2002 in 'basic arithmetic operation' and 'graph'. On the other hand, students' performance gradually decreased in unitary method, 22.5 percent in 2000 to 8.1 percent in 2001 and 2.5 percent in 2002. Nearly 30 percent of the students in 2000 and 19.5 percent in 2001 had skills in

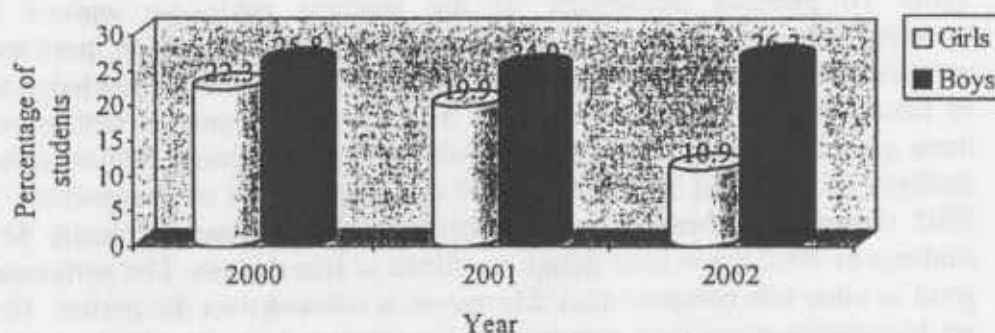
solving the problem on 'percentage'; surprisingly it increased to 40 percent among the students of 2002.

There was no significant difference among the students of different years in the achievement of the competency 'measurement unit'. Forty four to 47 percent of the students achieved this competency in different years. Although no gender difference was observed in the first two surveys, the boys were significantly ahead of the girls in 2002 (52.2% vs. 39.8%, $p < 0.01$).

In achieving the competency on 'geometric figure' the students of 2000 and 2001 performed equally, however the performance significantly increased among the students of 2002. Last survey shows that nearly 60 percent of the students of 2002 had this competency, 55.5 percent girls and 69.9 percent boys ($p < 0.01$). No gender difference was seen in the first two surveys.

Students' achieving all the five competencies in Mathematics significantly decreased over the period. In 2000, 23.6 percent of the students had all the five competencies in Mathematics, this was 21.7 percent in 2001 and 16.1 percent in 2002 (Table 8). In all the surveys, the boys were ahead of the girls in this regard (Figure 4). However, the gap increased over the period. Whereas, 25.8 percent of the boys and 22.3 percent of the girls had all five competencies in 2000, this was 24.0 percent and only 19.5 percent in 2001. Rapid reduction in girls' performance is noticeable, at the aggregate as well as competency level.

Figure 4 Percentage of students achieving all five competencies in Mathematics by year and sex



Achievement of Social Studies competencies

Students' learning achievement in six Social Studies competencies was assessed. These are duties as family member, duties as member of society, duties as citizen of Bangladesh, knowledge about the country, manners with other people, and knowledge about children of other countries. Thirteen multiple-choice question items were placed in

the test instrument to assess the above-mentioned six competencies. Table 9 gives summary of the competencies, test items, and minimum level of qualifying the competencies in Social Studies.

Table 9. Competencies, test items and minimum levels in Social Studies

Competency	Test items	Minimum level
Duties as family member	<ul style="list-style-type: none"> • How a family becomes a happy family • Responsibility of family members 	Answer correctly any one of the items on the left
Duties as a member of the society	<ul style="list-style-type: none"> • Responsibility as a member of the society • Why one should not play radio/TV loudly 	Answer correctly any one of the items on the left
Duties as citizen of Bangladesh	<ul style="list-style-type: none"> • Responsibility as a citizen • Eligibility to vote in national elections 	Answer correctly any one of the items on the left
Knowledge about the country	<ul style="list-style-type: none"> • Independence day • Major transportation system • Place of highest rainfall 	Answer correctly any two of the items on the left
Manners with other people	<ul style="list-style-type: none"> • Right manners with teachers • Right manners with younger siblings 	Answer correctly any one of the items on the left
Knowledge about children of other countries	<ul style="list-style-type: none"> • Main food of the children of Maldives • Popular games in Nepal 	Answer correctly any one of the items on the left

Table 10 presents percentage of the students achieving various Social Studies competencies in different years. Students showed very good performance in three competencies in all the three surveys. The competencies are knowledge about the duties as family member, duties as member of society and manners with other people. Over three quarters of the students had knowledge in these issues. Although two-thirds of the students of 2000 and 2001 knew their duties as citizen of Bangladesh, the students of 2002 showed a tremendous improvement in this competency. Nearly 94 percent of the students of 2002 knew their duties as citizen of Bangladesh. The performance was not so good in other two competencies. Moreover, it reduced over the period. The competencies are knowledge about own country and knowledge about the children of other countries. In 2002, respectively 41.1 percent and 45 percent of the students had these competencies.

Gender difference in Social Science competencies achievement increased over time. The boys were ahead of the girls in one Social Science competency in 2000, this increased to two in 2001 and three in 2002 (Annex 8).

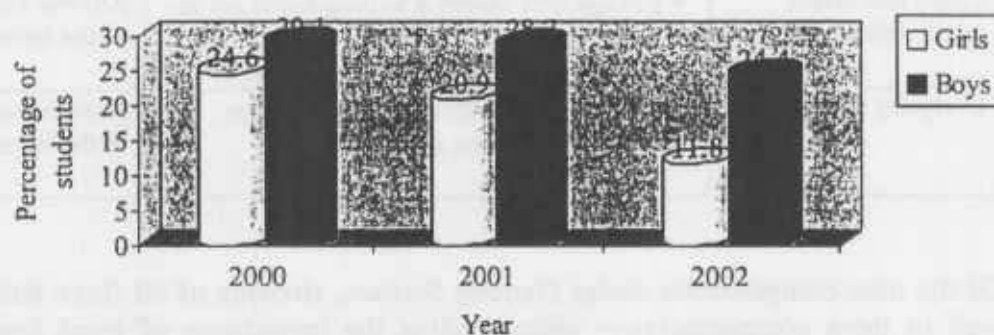
Table 10. Percentage of students achieving Social Studies competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	'00 vs. '01	'00 vs. '02	'01 vs. '02
Duties as family members	80.0	75.4	79.3	ns	Ns	ns
Duties as member of society	86.3	84.4	85.8	ns	Ns	ns
Duties as citizen of Bangladesh	66.8	67.1	93.7	ns	p<0.001	p<0.001
Knowledge about the country	51.6	46.3	41.1	ns	p<0.01	ns
Manners with other people	84.6	83.5	77.6	ns	p<0.01	p<0.05
Children of other countries	48.6	51.6	45.0	ns	Ns	p<0.05
All five	26.2	23.6	16.1	ns	p<0.001	p<0.01

ns = Not significant at p=0.05

Proportion of students achieving all the six Social Studies competencies significantly reduced over the period, 26.2 percent in 2000 to 23.6 percent in 2001 and 16.1 percent in 2002 (Table 10). Such deterioration was prominent among the girls, not among the boys. Twenty nine percent of the boys and 24.6 percent of the girls had all the Social Studies competencies in 2000, however these rates become 24.4 percent and 11.8 percent in 2002. This indicates that the girls were 4.5 percentage points behind the boys in this respect, which increased to 12.6 percentage points in 2002 (Figure 5).

Figure 5 Percentage of students achieving all six competencies in Social Studies by year and sex



Achievement of General Science competencies

Nine General Science competencies were assessed, five of whom are related to physical and environmental health and four on science and technology. The competencies are: understand the importance of good health, know physical and environmental health systems, understand the importance of balanced diet, know the preventive measures of common diseases, have information collection ability, observation skills on natural objects, ability in scientific investigation, identification of cause and effect relationship,

and knowledge on science and technology in everyday life. Two multiple-choice questions were prepared for assessing each of the competencies, totalling 18 for the subject. Table 11 provides the competencies, test items, and minimum level for qualifying the competencies of General Science.

Table 11. Competencies, test items and minimum levels for General Science

Competency	Test items	Minimum level
Knowledge about importance of good health	<ul style="list-style-type: none"> • How good health is achieved • Why one takes carbohydrate 	Answer correctly any of the items on the left
Knowledge about physical and environmental health	<ul style="list-style-type: none"> • Which tube well water is safe • How diarrhoea spreads 	Answer correctly any of the items on the left
Knowledge of balanced diet	<ul style="list-style-type: none"> • What is a balanced diet • Why should adolescents take extra food 	Answer correctly any of the items on the left
Knowledge about prevention of common illnesses	<ul style="list-style-type: none"> • Transmission of worms • Skin diseases 	Answer correctly any of the items on the left
Information collection ability	<ul style="list-style-type: none"> • What is the fastest mass media • Highest and lowest temperatures during summer 	Answer correctly any of the items on the left
Observation skills	<ul style="list-style-type: none"> • Which tree has no branch • Plant without a flower 	Answer correctly any of the items on the left
Scientific investigation	<ul style="list-style-type: none"> • Identification of preventive measures for given illness • Identify effects of over population 	Answer correctly any of the items on the left
Cause and effect relationship	<ul style="list-style-type: none"> • Energy that causes a boiling kettle lid to move up • Energy which drives a bullock cart 	Answer correctly any of the items on the left
Everyday science	<ul style="list-style-type: none"> • What is information communication • What are modern agricultural technologies 	Answer correctly any of the items on the left

Of the nine competencies under General Science, students of all three cohorts did very well in three competencies – understanding the importance of good health, knowing physical and environmental health systems, and having information ability (Table 12). There was no difference among the students of different cohorts in achieving the first two competencies, however, in the third, the students of 2002 did significantly better than other two groups of students. The students also did well in the competencies ‘importance of balance diet’ and ‘observation skills on natural objects’. Although less than 60 percent of the students of 2000 had the competency on ‘science and technology in everyday life’, the performance significantly improved among the students of the next two years. Nearly 74 percent of the students of 2002 achieved this competency. Performance of the students of the years 2001 and 2002 was not as good as those of the year 2000 in the competency ‘cause and effect relationship’. Again, students’ knowledge in ‘prevention of common diseases’ decreased in 2002.

Table 12. Percentage of students achieving General Science competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	'00 vs. '01	'00 vs. '02	'01 vs. '02
Importance of good health	89.7	91.5	90.8	Ns	ns	ns
Physical and environmental health systems	84.3	84.4	85.6	Ns	ns	ns
Importance of balanced diet	67.7	70.1	70.0	Ns	ns	ns
Prevention of common diseases	61.7	55.6	54.4	Ns	p<0.05	ns
Information collection ability	83.4	81.1	86.4	Ns	ns	p<0.05
Observation skills on natural objects	79.0	77.3	76.6	Ns	ns	ns
Scientific investigation skills	64.9	64.3	66.9	Ns	ns	ns
Cause and effect relationship	70.9	61.1	63.3	p<0.01	p<0.05	ns
Science and technology in everyday life	58.1	72.8	73.9	p<0.001	p<0.001	Ns
All five	22.8	20.3	20.0	Ns	ns	Ns

ns = Not significant p=0.05

Here also, the girls are going behind the boys in competency achievement. Gender difference favouring boys was seen in one competency in 2000, which increased to two in 2001, and five in 2002 (Annex 9). Girls of all the three batches lagged behind their counterpart boys in the competency 'information collection ability'.

Nearly 23 percent of the students of 2000 achieved all the nine competencies in General Science, this reduced to about 20 percent for the next two cohorts (Figure 6). However, no significant variation was observed among the cohorts. Although there was no significant gender difference in this regard, the difference between boys and girls increased over time. For instance, the girls were 1.6 percentage points behind the boys in achieving all General Science competencies in 2000, this increased up to 5.9 percentage points in 2002.

Figure 6 Percentage of students achieving all General Science competencies by year and sex



Table 12. Percentage of students achieving General Science competencies by year

Competencies	Year			Level of significance		
	2000	2001	2002	'00 vs. '01	'00 vs. '02	'01 vs. '02
Importance of good health	89.7	91.5	90.8	Ns	ns	ns
Physical and environmental health systems	84.3	84.4	85.6	Ns	ns	ns
Importance of balanced diet	67.7	70.1	70.0	Ns	ns	ns
Prevention of common diseases	61.7	55.6	54.4	Ns	p<0.05	ns
Information collection ability	83.4	81.1	86.4	Ns	ns	p<0.05
Observation skills on natural	70.0	77.7	76.6	Ns	ns	ns

Classification of the competencies according to the performance of the students is provided in Annexes 11 to 13. In 2000, the students did 'excellent' in 8 competencies, 'satisfactory' in 11, 'mediocre' in 5, and 'poor' in 3 competencies. However, the survey of 2001 shows that the students did 'excellent' in 6 competencies, 'satisfactory' in 13, 'mediocre' in 5, and 'poor' in 3 competencies. The distribution for 2002 was similar to that of 2001. The analysis shows that the students of BRAC Non-formal Primary Education remain 'poor' in the following three competencies after completing the full course. These competencies are very difficult for them to achieve.

- Writing in English
- Problem solving in Mathematics
- Life history of prophet Mohammed (SM) or the preachers of own religion

Students' also showed a 'moderate' performance (or face difficulty) in the following six competencies.

- Measurement units
- Identification of geometric figures
- Know about the country
- Know about the children of other countries
- Science and technology in everyday life
- Prevention of common diseases

On the other hand, students' of all the three cohorts showed 'excellent' performance in the following five competencies.

- Listening in Bangla
- Duties as member of the society
- Importance of good health
- Physical and environmental health systems
- Information collection ability

It seems that BRAC NFPE students remain weaker mostly in the competencies in Mathematics. Writing English and Religious Studies also need to be taken care off.

Achievement of all competencies

Table 14 provides percentage of students achieving all the competencies by subject and sex at a glance. In all the three surveys, highest proportion of the students achieving all the competencies was in Bangla, followed by English. Social Studies was third in the first two surveys, followed by Mathematics and General Science. However, in the last survey General Science was placed in the third position, and Mathematics and Social Studies jointly fourth. It is surprising to see that these percentages were lower for 2002 than other two surveys in all the subject areas. Downward performance of the girls in Mathematics and Social Studies is seen here again.

Table 14. Percentage of students achieving all the competencies by subject and sex

Subject	Boys			Girls			Both		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Bangla	51.6	58.9	53.1	45.1	48.3	45.0	47.5	52.0	47.8
English	22.5	34.4	29.7	28.0	28.0	27.5	26.0	30.3	28.2
Mathematics	25.8	24.9	26.3	22.3	19.9	10.9	23.6	21.7	16.1
Social Studies	29.1	28.7	24.4	24.6	20.9	11.8	26.2	23.6	16.1
General Science	23.6	22.0	23.9	22.3	19.4	18.0	22.8	20.3	20.0

Figure 7 presents percentage of students achieving all the 27 competencies by year and sex. Although not much variation was observed in such performance of the students of first two years, it deteriorated in the third survey. In 2000, 8.5 percent of the students achieved all 27 competencies, which slightly decreased to 8.1 percent in 2001, and again decreased to 5.2 percent in 2002. Such variations are not statistically significant. When data were analysed by sex, it was observed that there was no gender variation in such performance of first two years. However, in 2002, the girls performed significantly less than the boys; 9.6 percent of the boys and only 2.8 percent of the girls achieved all the 27 competencies ($p < 0.01$). Over the period, boys' performance had increased a little, but the girls' performance significantly deteriorated over time ($p < 0.05$).

Figure 7 Percentage of students achieving all 27 competencies by year and sex



Mean number of competencies achieved

Unlike the above-mentioned findings, mean number of competencies achieved by the students at the aggregate level did not reduce over time (Table 15). On average, the students of 2000 achieved 18.1 competencies, which slightly reduced to 17.9 in 2001, and again increased to 18.2 in 2002. It seems that the students altogether achieved two-thirds of the competencies. Mean number of competencies achieved was less for girls than the boys. A half of the students of 2000 and 2001 achieved 18 or more number of competencies. On the other hand, half of the students of 2002 achieved 19 or more

number of competencies. The coefficient of variation of number of competencies achieved is decreasing over time. This indicates that the students of recent year are more homogeneous than previous years. The boys were more homogeneous than the girls.

Table 15. Some basic statistics on number of competencies achieved by the students

Year	Sex	Mean	Median	Standard deviation	Coefficient of variation
2000	Boys	18.7	18.5	5.2	27.8
	Girls	17.8	18.0	5.8	32.6
	Both	18.1	18.0	5.6	30.9
2001	Boys	18.8	19.0	5.2	27.7
	Girls	17.4	17.0	5.4	31.0
	Both	17.9	18.0	5.3	29.6
2002	Boys	19.6	20.0	4.9	25.0
	Girls	17.5	18.0	5.1	29.1
	Both	18.2	19.0	5.1	28.0

Statistically, there was no difference between the boys and girls of 2000 in respect to mean number of competencies achievement. However, the boys were found ahead of the girls in the following two surveys (Annex 14).

Annex 15 shows that the lowest quartile of the students of all the three batches achieved 14-15 or less number of competencies and the highest quartile achieved at least 21-22 competencies. A half of the students achieved 18-19 or more number of competencies.

Mean number of correctly answering items

Of the 64 items in the test, the students of 2000, on average, made correct answer to 36. This was 33.4 for the students of 2001 and 34.8 for the students of 2002. This means that at the aggregate level, the students could make correct answers to 52-56 percent of the questions in the test. The students of all the three years made more correct answers in Bangla and less in Mathematics. The students collectively failed to solve half of the Mathematics problems.

Table 16. Mean number of correctly answering items by subject and year

Subject	Number of question items	2000		2001		2002	
		Mean	%	Mean	%	Mean	%
Bangla	10	7.0	70.0	7.0	70.0	7.1	71.0
English	7	4.3	61.4	4.1	58.6	4.5	64.3
Mathematics	15	7.4	49.3	6.4	42.7	7.0	46.7
Social Studies	13	7.1	54.6	6.4	49.2	6.6	50.8
General Science	18	9.6	53.3	9.1	50.6	9.4	52.2
All	64*	36.0	56.3	33.4	52.2	34.8	54.4

* Includes one competency on Religious Studies

Separate analysis for boys and girls shows that gender difference against girls is increasing over time (Annex 14). In 2000, the mean number of items correctly answering was 36.8 for boys and 35.5 for girls, with a difference of 1.3 percentage points. This gap increased to 2.6 percentage points in 2001 with the same direction (boys 35.1 and girls 32.5; $p < 0.01$), and to 3.9 percentage points in 2002 (boys 36.7 and girls 32.8; $p < 0.001$).

Annex 15 shows that of the 64 items in the test, the lowest quartile of the students of all the three batches made correct answers to 25-27 or less number of questions and the best quartile did so at least 41-43 questions. A half of the students made correct answers to 33-35 questions.

School level analysis

This section presents analysis considering school as unit. This helps seeing how far the achievement of the students varies from one school to another. A wide variation was observed in the performance of the schools, however it is reducing over time. In 2000, the range between highest and lowest performing schools was 17.3 competencies, which reduced to 12.9 competencies in 2002. The coefficient of variation was 26.4 percent in 2000, which reduced to 18.2 percent in 2001 and to 17.8 percent in 2002 (Table 17).

Table 17. School level analysis: some basic statistics of mean number of competencies achieved

Year	Number of schools	Minimum	Maximum	Range	Mean	Standard deviation	Co-efficient of variation
2000	26	9.4	26.7	17.3	18.2	4.8	26.4
2001	30	12.8	23.9	11.1	18.1	3.3	18.2
2002	30	10.4	23.3	12.9	18.5	3.3	17.8

Performance according to taxonomic class level of items

The question items placed in the test instrument were classified according to taxonomic class level. Of the 64 question items 45 are of knowledge level and 19 are of understanding level (6 comprehensive, 3 synthesis, 3 analysis, and 7 application). This section presents students' performance on the basis of such classification (Table 18). On average, students did better in the knowledge level items than those of understanding level. For instance, in 2002, the students made correct answers to 58.9 percent of the knowledge level items and 43.7 percent of the understanding level items.

Table 18. Performance of the students according to the taxonomic class level of items

Subject	Number of items	2000		2001		2002	
		Mean	%	Mean	%	Mean	%
Knowledge	45	26.8	59.6	25.3	56.2	26.5	58.9
Understanding	19	8.9	46.8	8.0	42.1	8.3	43.7
Comprehension	6	3.3	55.0	3.2	53.5	3.2	53.3
Application	7	2.7	38.6	2.0	28.6	2.3	32.9

Analysis	3	1.1	36.7	1.0	33.0	1.0	33.3
Synthesis	3	1.9	63.3	1.8	60.0	1.7	56.7

Highlights of the findings

Competencies achievement of the learners who had completed the full primary curriculum of NCTB in the non-formal primary schools of BRAC are presented in different sections of this report. Three batches of students were tested immediately after the end of the respective academic year. These are the students of second, third, and fourth batches after shifting from three years to four years programme. It may be mentioned that BRAC's primary school programme was primarily designed as a three years programme. It offers full course of primary education from 1995. Instrument used for this study was basically developed for the *Education Watch 2000*.

Students of all the three batches performed equally. Of the 27 competencies considered for the test, on average, the students of each batch achieved about 18 competencies. Otherwise, the mean number of competencies achieved by the students was mostly equal in all the surveys. This means that, on average, the students of NFPE achieved two-thirds of the competencies assessed.

On the other hand, mean number of items correctly answering by the students varied year to year. It significantly reduced from 36 items in 2000 to 33.4 items in 2001, and then increased to 34.8 items in 2002. Students of all three surveys made correct answers to 52-56 percent of the test items. This clearly shows that the students, after completing full course of primary education in BRAC's NFPE, were not able to make correct answers to over 40 percent of the items in the test. Findings of this study also identified that the students were weaker mostly in Mathematics, Social Studies and General Science.

This study also found that proportion of students achieving all the 27 competencies decreased over time, 8.5 percent in 2000, 8.1 percent in 2001 and 5.2 percent in 2002.

The students of recent years are more homogeneous than the previous years. Analysis of co-efficient of variation of number of competencies achieved and the number of correct answers made ensured this. Similar tendency was also observed when data were analysed for boys and girls separately. This is good from equity perspective.

Inter-school variation reduced over time. It was observed in *Education Watch 2000* that school-to-school variation was more in the non-formal schools than the formal schools. This is because non-formal schools are run by many NGOs at various situations. School-level analysis of this study shows that inter-school variation in BRAC system is reducing over time. This is also a good sign in respect to equity.

Gender difference in achievement is a serious issue. Overall, boys-girls gap is increasing in BRAC schools over time. In 2000 there was only three competencies where boys significantly outperformed the girls, this number increased to seven in 2001 and 14 in

2002. At least two competencies can be identified where the girls of all the three batches were behind the boys. These are: *Reading skills in Bangla* and *Information collection ability*.

In respect to mean number of competencies achievement, there was no gender difference in 2000. However, a declining tendency in the girls' performances was noticed first in 2001, which continued till 2002. The boys of 2000, on average, achieved nearly one more competency than the girls, this gap increased to 1.4 competencies in 2001 and to 2.1 competencies in 2002. Gender difference against girls significantly increased in mean number of correctly answering items. The boys of 2000, on average, made correct answers to 1.3 items more than the girls, this gap increased to 2.6 items in 2001, and to 3.9 items in 2002. Subject-wise, serious differentiation was noticed in Mathematics, Social Studies and Religious Studies. The latest ABC study on BRAC school students also showed that gender difference in BRAC school programme is increasing.

Thus, three issues need to be consideration. Firstly, the programme should try to continue the trend of homogeneity in students' performance. Secondly, more emphasis on competency-based outcome oriented management and supervision can increase average competency achievement of the students. Thirdly, the programme deserves special effort focusing on girls' quality education. This can be done through training of the teachers (to sensitise them about the issue and to teach them the techniques to handle the situation) and monitoring programme of the Programme Organisers (put the issue in monitoring schedule and provide feed back to the teachers accordingly during supervision and share experiences during monthly training sessions).

Annex 1. Competencies tested under this study

Subject area	Competencies
Bangla	Reading skills Writing skills Listening skills
English	Reading skills Writing skills Listening skills
Mathematics	Basic number skills Four basic rules of arithmetic Problem solving Measurement units Identification of geometric figures
Social Science	Duties as family member Duties as member of society Duties as citizen of Bangladesh Know about the country Manners with persons of various relationship Know about the children of other countries
General Science	Importance of good health Physical and environmental health systems Importance of balanced diet Prevention of common diseases Information collection ability Observation skills on natural objects Scientific investigation skills Identification of cause and effect relationship Science and technology in everyday life
Religious Studies	Life sketch of prophet Mohammed (SM) or the preachers of own religion

Annex 2. Percentage of students achieving Bangla competencies by year and sex

Competencies	Year		
	2000	2001	2002
<i>Reading skills</i>			
Girls	67.4	63.0	69.2
Boys	76.9	74.6	83.7
Significance	p<0.05	p<0.01	p<0.001
<i>Writing skills</i>			
Girls	73.1	68.2	61.6
Boys	71.4	75.1	64.6
Significance	ns	ns	ns
<i>Listening skills</i>			
Girls	81.7	88.6	83.4
Boys	84.1	93.8	88.5
Significance	ns	ns	ns

Annex 3. Percentage of students made correct answers to various items on writing skills in Bangla by year

Items	Year		
	2000	2001	2002
Description of a given scenery	71.8	61.3	58.2
Description of own home	78.6	77.7	75.0
Fill out a form	96.1	97.4	95.7
Writing application to teacher			
Date	46.2	32.8	30.0
Salutation	60.3	79.5	75.6
Message	77.5	79.6	50.6
Closing	62.5	66.4	57.1

Annex 4. Percentage of students achieving English competencies by year and sex

Competencies	Year		
	2000	2001	2002
<i>Reading skills</i>			
Girls	73.7	65.4	74.4
Boys	75.8	72.2	79.9
Significance	ns	ns	ns
<i>Writing skills</i>			
Girls	41.1	35.5	33.2
Boys	35.7	39.2	38.8
Significance	ns	ns	ns
<i>Listening skills</i>			
Girls	68.6	73.6	79.1
Boys	67.0	85.6	81.3
Significance	ns	p<0.001	ns

Annex 5. Percentage of students achieving Mathematics competencies by year and sex

Competencies	Year		
	2000	2001	2002
<i>Basic number</i>			
Girls	77.7	76.3	78.7
Boys	80.8	78.0	79.4
Significance	ns	ns	ns
<i>Four basic rules</i>			
Girls	81.1	70.6	73.0
Boys	83.5	78.0	81.3
Significance	ns	ns	p<0.05
<i>Problem solving</i>			
Girls	37.1	30.8	32.2
Boys	43.4	32.1	44.0
Significance	ns	ns	p<0.01
<i>Measurement unit</i>			
Girls	45.7	45.5	39.8
Boys	48.9	48.8	52.2
Significance	ns	ns	p<0.01
<i>Geometric figures</i>			
Girls	52.6	49.8	55.5
Boys	53.3	54.5	67.9
Significance	ns	ns	p<0.01

Annex 6. Percentage of students made correct answers to the items under 'basic four rules of arithmetic' by year

Items	Year		
	2000	2001	2002
Addition	87.9	86.4	89.1
Subtraction	80.3	77.0	74.2
Multiplication	69.6	65.0	66.3
Division	45.6	31.6	38.3
Simplification	60.0	56.0	57.2

Annex 7. Percentage of students made correct answers to the items under 'mathematical problem solving' by year

Items	Year		
	2000	2001	2002
Basic arithmetic operation	53.5	37.8	36.7
Unitary method	22.5	8.1	2.5
Percentage	29.9	19.5	40.0
Graph	38.0	32.8	33.0

Annex 8. Percentage of students achieving Social Science competencies by year and sex

Competencies	Year		
	2000	2001	2002
<i>Duties as family member</i>			
Girls	78.3	73.0	78.7
Boys	83.0	79.9	80.4
Significance	ns	ns	ns
<i>Duties as member of society</i>			
Girls	83.4	81.0	83.9
Boys	91.2	90.4	89.5
Significance	p<0.05	p<0.01	ns
<i>Duties as citizen of Bangladesh</i>			
Girls	65.7	63.0	92.4
Boys	68.7	74.6	96.2
Significance	ns	p<0.01	p<0.05
<i>Knowledge about the country</i>			
Girls	49.7	45.5	36.5
Boys	54.9	45.0	50.2
Significance	ns	ns	p<0.01
<i>Manners with other people</i>			
Girls	84.6	83.4	73.9
Boys	84.6	83.7	84.7
Significance	ns	ns	p<0.01
<i>Children of other countries</i>			
Girls	47.4	52.1	43.1
Boys	50.5	50.7	48.8
Significance	ns	ns	ns

Annex 9. Percentage of students achieving General Science competencies by year and sex

Competencies	Year		
	2000	2001	2002
<i>Importance of good health</i>			
Girls	88.6	91.0	89.1
Boys	91.8	92.3	94.3
Significance	ns	ns	p<0.05
<i>Physical and environmental health systems</i>			
Girls	83.4	82.5	83.4
Boys	85.7	88.0	90.0
Significance	ns	ns	p<0.05
<i>Importance of balanced diet</i>			
Girls	66.9	69.7	66.8
Boys	69.2	70.8	76.1
Significance	ns	ns	p<0.05
<i>Prevention of common diseases</i>			
Girls	61.1	53.6	53.1
Boys	62.6	59.3	56.9
Significance	ns	ns	ns
<i>Information collection ability</i>			
Girls	80.6	78.7	83.9
Boys	88.5	86.1	91.4
Significance	p<0.05	p<0.05	p<0.01
<i>Observation skills on natural objects</i>			
Girls	78.3	76.8	76.3
Boys	80.2	78.9	77.0
Significance	ns	ns	ns
<i>Scientific investigation skills</i>			
Girls	63.4	62.6	64.5
Boys	67.6	67.5	71.8
Significance	ns	ns	ns
<i>Cause and effect relationship</i>			
Girls	69.7	60.2	58.3
Boys	73.1	62.7	73.2
Significance	ns	ns	p<0.001
<i>Science and technology in everyday life</i>			
Girls	54.9	69.7	71.6
Boys	63.7	78.5	78.5
Significance	ns	p<0.05	ns

Annex 10. Percentage of students achieving Religious Studies competency by year and sex

Competencies	Year		
	2000	2001	2002
<i>Life history of prophet Mohammed (SM) or the preachers of own religion</i>			
Girls	30.3	28.4	19.0
Boys	34.1	36.4	34.9
Significance	ns	p<0.05	p<0.001

Annex 11. Classification of the competencies according to the level of performance, 2000

Level of performance	Competencies	Difficulty level
Poor	<ul style="list-style-type: none"> • Writing in English • Problem solving in Mathematics • Life history of prophet Mohammed (SM) or the preachers of own religion 	Very difficult
Mediocre	<ul style="list-style-type: none"> • Measurement units • Identification of geometric figures • Know about the country • Know about the children of other countries • Science and technology in everyday life 	Difficult
Satisfactory	<ul style="list-style-type: none"> • Reading in Bangla • Writing in Bangla • Reading in English • Listening in English • Basic number skills • Duties as citizen of Bangladesh • Importance of balanced diet • Observation skills on natural objects • Scientific investigation skills • Prevention of common diseases • Identification of cause and effect relationship 	Easy
Excellent	<ul style="list-style-type: none"> • Listening in Bangla • Basic rules of arithmetic • Duties as family member • Duties as member of society • Importance of good health • Manners with persons of various relationship • Physical and environmental health systems • Information collection ability 	Very easy

Annex 12. Classification of the competencies according to the level of performance, 2001

Level of performance	Competencies	Difficulty level
Poor	<ul style="list-style-type: none"> • Writing in English • Problem solving in Mathematics • Life history of prophet Mohammed (SM) or the preachers of own religion 	Very difficult
Mediocre	<ul style="list-style-type: none"> • Measurement units • Identification of geometric figures • Know about the country • Know about the children of other countries • Prevention of common diseases 	Difficult
Satisfactory	<ul style="list-style-type: none"> • Reading in Bangla • Writing in Bangla • Reading in English • Listening in English • Basic number skills • Basic rules of arithmetic • Duties as family member • Duties as citizen of Bangladesh • Importance of balanced diet • Observation skills on natural objects • Scientific investigation skills • Science and technology in everyday life • Identification of cause and effect relationship 	Easy
Excellent	<ul style="list-style-type: none"> • Listening in Bangla • Duties as member of society • Importance of good health • Manners with persons of various relationship • Physical and environmental health systems • Information collection ability 	Very easy

Annex 13. Classification of the competencies according to the level of performance, 2002

Level of performance	Competencies	Difficulty level
Poor	<ul style="list-style-type: none"> • Writing in English • Problem solving in Mathematics • Life history of prophet Mohammed (SM) or the preachers of own religion 	Very difficult
Mediocre	<ul style="list-style-type: none"> • Measurement units • Identification of geometric figures • Know about the country • Know about the children of other countries • Prevention of common diseases 	Difficult
Satisfactory	<ul style="list-style-type: none"> • Reading in Bangla • Writing in Bangla • Reading in English • Listening in English • Basic number skills • Basic rules of arithmetic • Duties as family member • Manners with persons of various relationship • Importance of balanced diet • Observation skills on natural objects • Scientific investigation skills • Identification of cause and effect relationship • Science and technology in everyday life 	Easy
Excellent	<ul style="list-style-type: none"> • Listening in Bangla • Duties as member of society • Duties as citizen of Bangladesh • Importance of good health • Physical and environmental health systems • Information collection ability 	Very easy

Annex 14. Mean number of competencies and mean number of items by year and sex

Subject	Sex	Year			Significance
		2000	2001	2002	
Competencies	Boys	18.7	18.8	19.6	ns
	Girls	17.8	17.4	17.5	ns
	Both	18.1	17.9	18.2	ns
	Significance	ns	p<0.01	p<0.001	
Items	Boys	36.8	35.1	36.7	ns
	Girls	35.5	32.5	32.8	p<0.05
	Both	36.0	33.4	34.8	p<0.01
	Significance	ns	p<0.01	p<0.001	

Annex 15. Quartiles of number of competencies and number of items by year

Subject	Year	Quartiles		
		First	Second	Third
Number of competencies	2000	14.0	18.0	22.0
	2001	14.0	18.0	21.0
	2002	15.0	19.0	22.0
Number of items	2000	27.0	34.0	43.0
	2001	25.0	33.0	41.0
	2002	27.0	35.0	42.0